

Serial No. 09/744,250
Amdt. dated December 2, 2004
Reply to Office action of July 2, 2004

-2-

Amendments to the Claims:

The following listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An apparatus for detecting a moving object in a sequence of color frame images, said color frame images having a plurality of pixels, each pixel having three color components, comprising:

a color normalizer for normalizing color components of each color frame image to produce a normalized color frame image, said color normalizer normalizing each color component R, G and B of each pixel into normalized color components r, g and b using the following relationships:

$$\underline{r=R/(R+G+B),}$$

$$\underline{g=G/(R+G+B),}$$

$$\underline{\text{and } b=B/(R+G+B);}$$

a color transformer coupled to the color normalizer for color transforming the normalized color frame image to a first color transformed frame image, said first color transformed frame image having intensity levels such that pixels corresponding to

Serial No. 09/744,250
Amdt. dated December 2, 2004
Reply to Office action of July 2, 2004

-3-

said moving object are emphasized;

a frame delay coupled to the color transformer for delaying the first color transformed frame image by one frame, said delayed first color transformed frame image being a second color transformed frame image; and

a motion detector coupled to the color transformer and the frame delay for detecting the motion of the moving object and further intensifying the intensity levels of said first color transformed frame image based on the detected motion.

2. (Canceled)

3. (Canceled)

4. (Previously presented) The apparatus of Claim 1, wherein:

said motion detector comprises means for detecting the motion of each pixel by counting pixels adjacent said each pixel whose intensity level differences between said first and second color transformed frame images are larger than a threshold value; and

said intensity level of each pixel is further intensified by weighting said intensity level in accordance with said detected motion of said each pixel.

5. (Original) The apparatus of Claim 4, wherein said weighting is performed by fuzzy-AND operating said intensity level with said detected motion for said each pixel.

6. (Original) The apparatus of Claim 4, wherein said threshold value is obtained by using a Sigmoid function as follows:

$$Th(Z) = \frac{255}{1 + e^{\frac{z(x,y,t) - \frac{255}{2}}{Q}}}$$

wherein $Z(x,y,t)$ is the intensity level of a pixel and Q is a predetermined parameter.

7-12. (Canceled)

13. (Previously presented) An apparatus for detecting a moving object in a sequence of color frame images, said color frame images having a plurality of pixels, each pixel having three color components, comprising:

a color normalizer for normalizing color components of each color frame image to produce a normalized color frame image;

a color transformer coupled to said color normalizer for

Serial No. 09/744,250
Amdt. dated December 2, 2004
Reply to Office action of July 2, 2004

-5-

color transforming said normalized color frame image to a first color transformed frame image, said first color transformed frame image having intensity levels such that pixels corresponding to said moving object are emphasized;

a frame delay coupled to said color transformer for delaying said first color transformed frame image by one frame, said delayed first color transformed frame image being a second color transformed frame image;

a motion detector coupled to said color transformer and said frame delay for detecting the motion of the moving object and further intensifying the intensity levels of said first color transformed frame image based on the detected motion; and

the intensity level of said each pixel of said first color transformed frame image and the normalized color components of the pixel has a relationship as follows:

$$Z(x,y) = GF(r(x,y),g(x,y)) \quad (x,y) \in I$$

where (x,y) is a coordinate of said pixel in said normalized frame image,

$Z(x,y)$ is the intensity level of said pixel of said first color transformed frame image at the coordinate (x,y) ,

$r(x,y)$ and $g(x,y)$ are normalized color components of said pixel at the coordinate (x,y) , and

$GF()$ is a 2-dimensional Gaussian distribution function.